

HATCHERY EVALUATION REPORT

**Wallowa Hatchery - Summer Steelhead (Imnaha
Stock)**

September 1996

Integrated Hatchery Operations Team (IHOT)

HATCHERY EVALUATION REPORT

Wallowa Hatchery - Summer Steelhead, Imnaha Stock

An Independent Audit Based on Integrated Hatchery Operations Team (IHOT) Performance Measures

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CONTENTS

Section 1 Executive Summary	1-1
Section 2 Facility Description	2-1
Section 3 Compliance Status	3-1
Section 4 Remedial Actions	4-1
Section 5 Hatchery Contribution to Fisheries, Spawning Grounds and Hatcheries	5-1
Section 6 Annual Operating Expenditures	6-1

List of Tables

Table

1	Summary Program Information for Wallowa Hatchery - Summer Steelhead (Imnaha Stock)
2	Compliance with Performance Measures: Wallowa Hatchery - Summer Steelhead (Imnaha Stock)
3	Remedial Actions Required: Wallowa Hatchery - Summer Steelhead (Imnaha Stock)

- 4 Adult Contribution to Fisheries, Spawning Grounds and Hatcheries: Wallowa Hatchery - Summer Steelhead (Imnaha Stock)
- 5 Annual Operating Expenses: Wallowa Hatchery - Summer Steelhead (Imnaha Stock)
- 6 Annual Operating Expenses - Wallowa Hatchery

Executive Summary

This report presents the findings of the independent audit of the Wallowa Hatchery - Summer Steelhead (Imnaha Stock) program. The hatchery is located along Spring Creek, a tributary of the Wallowa River, 1 mile east of Enterprise, Oregon. Site elevation is 3,700 feet above sea level. Big Canyon and Little Sheep Creek acclimation facilities are operated as satellite facilities to the Wallowa Hatchery. The hatchery and its satellite facilities are used for adult collection, egg incubation, and acclimation of Summer Steelhead (Imnaha Stock) and Summer Steelhead (Imnaha Stock).

The audit was conducted in 1996-1997 as part of a 2-year effort that will include 67 hatcheries and satellite facilities located on the Columbia and Snake River system in Idaho, Oregon, and Washington. The hatchery operating agencies include the U.S Fish and Wildlife Service, Idaho Department of Fish and Game, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife.

Background

The audit is being conducted as a requirement of the Northwest Power Planning Council (NPPC) Strategy for Salmon and the Columbia River Basin Fish and Wildlife Program. Under the audit, the hatcheries are evaluated against policies and related performance measures developed by the Integrated Hatchery Operations Team (IHOT). IHOT is a multi-agency group established by the NPPC to direct the development of new basinwide standards for managing and operating

fish hatcheries. The Bonneville Power Administration (BPA) contracted with Montgomery Watson to act as an independent contractor for the audit.

IHOT has established five basic policies that cover: (1) hatchery coordination, (2) hatchery performance standards, (3) fish health, (4) ecological interaction, and (5) genetics. The audit focuses on all these policies, with the exception of hatchery coordination. These policies are set forth in *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries (IHOT 1995)*. That document is the source for the performance measures that are the basis of this audit.

The Audit Process

The audit was based on the facility management's response to a 109-page questionnaire. This audit form was completed through a five-step process in which:

- Information was obtained from headquarters.
- The hatchery manager was asked to fill out and return the audit form.
- A 1-2 day site audit visit was conducted to inspect facilities, review hatchery records, discuss audit form responses, and develop remedial action plans.
- A compliance report was developed to document the compliance status of each performance measure. This report was then shared with the hatchery manager and IHOT representative.
- Based on the compliance report, this hatchery evaluation report was written to document compliance with IHOT performance measures and develop cost estimates for remedial actions when needed.

Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Results

The Wallowa Hatchery facility includes one pond for adult holding, 2 acclimation ponds, and 2 separate incubation facilities. The satellite facilities include adult holding and acclimation ponds. The hatchery was renovated in 1985 as part of the Lower Snake River Compensation Program (LSRCP) - a program to mitigate for spring chinook and summer steelhead losses caused by the four federal dams constructed on the lower Snake River.

The Wallowa hatchery was in general compliance with most of the performance measures. In the area of program objectives, the hatchery was not meeting its adult return goal. The audit found that the hatchery was not in compliance with the following facilities requirements: alarm annunciator system and water quality monitoring. The hatchery needs to develop incubation and rearing standards, smoltification goals, and follow the IHOT fertilization standards. In the compliance area for fish health policy, the hatchery was not using footbaths in the incubation area.

The specific areas in which the Wallowa Hatchery - Summer Steelhead (Imnaha Stock) program requires remedial actions based on the IHOT performance measures are listed below. These remedial actions are listed in alphabetical order without intent of ranking or otherwise assigning priority:

- Begin routine testing of alarms using IHOT recommendations
- Conduct IHOT feed QA/QC testing
- Develop green-egg to eyed survival goal
- Develop smoltification goal and monitoring plan

- Develop specific acclimation standards for the Operation Plan
- Develop specific incubation standards for the Operation Plan
- Develop genetics M&E plan for IHOT
- Follow IHOT and LSRCF protocols for fertilization
- Follow IHOT disinfection policies for transportation
- Improve communication between evaluation biologists and hatchery manager
- Install footbaths in incubation areas
- Monitor DO and TGP
- Replace annunciator panel for hatchery alarms
- Review density criteria for acclimation
- Run analysis for alkalinity and hardness
- Run analysis for chemistry parameters
- Run analysis for contaminants
- Run analysis for nitrite
- Run analysis for turbidity

Non-compliance issues resulting from items beyond human control or Performance Measures not relevant to this hatchery (Type 1 in Table 3, Section 4 of this report) were not listed above.

Facility Description

Name: Wallowa Hatchery

Stock/Species: Summer Steelhead, Grande Ronde Stock

Summer Steelhead, Imnaha Stock

Rainbow trout

Operating Agency: Oregon Department of Fish and Wildlife

Funding Agency: Lower Snake River Compensation Program (Steelhead only)

ODF&W (Rainbow Trout)

Location: Enterprise, Oregon

Address: Wallowa Hatchery

82199 Wallowa Fish Hatchery Lane

Enterprise, OR 97828

Hatchery Manager: Mr. Greg Davis

Phone: (541) 426-4467

Fax: (541) 426-8029

Purpose: Wallowa Hatchery began operation in 1920 as a resident trout hatchery. In 1985, the hatchery was renovated as part of the Lower Snake River Compensation Program (LSRCP) - a program to mitigate for spring chinook and summer steelhead losses caused by the four federal dams constructed on the lower Snake River.

This hatchery provides fish for ocean and river fisheries and eggs to other programs.

Production Goal:

Summer Steelhead (Grande Ronde Stock)

Collect 2,33 million eggs for transfer to Irrigon Hatchery

Collect 425,000 eggs for transfer to Lyons Ferry Hatchery

Acclimate 612,500 smolts (122,500 pounds) from Irrigon

Hatchery for on-station release.

Acclimate 375,000 smolts (75,000 pounds) from Irrigon

Hatchery release into Deer Creek (Big Canyon facility)

Summer Steelhead (Imnaha Stock)

Collect 480,000 eggs for transfer to Irrigon Hatchery

Acclimate 200,000 smolts (40,000 pounds) from Irrigon

Hatchery release into Little Sheep Creek (Little Sheep Creek facility)

Rainbow Trout

Produce 118,000 legal-sized fish for release into Imnaha system and 5,000 fingerlings for release into lakes

Total steelhead production: 125,500 pounds

Water Supply:

Gravity water supply from Wallowa River and Spring Creek

Two wells

Two springs (upper and lower)

Water rights for the entire hatchery totals 23,813 gpm

Facilities:

Incubation:	57 4-stack vertical tray (Grande Ronde Stock) 15 4-stack vertical tray (Imnaha Stock)
Adult Holding:	1 concrete pond - 1350 cf
Raceways:	none used for steelhead
Rearing Ponds:	2 concrete acclimation ponds - 50,400 cf each
Satellite Facilities:	Big Canyon 1 adult holding pond - 1,350 cf 2 concrete acclimation ponds - 18,000 cf each Little Sheep Creek 1 adult holding pond - 2880 cf 1 concrete acclimation ponds - 39,000 cf

Compliance Status

The hatchery audits are based on compliance with written IHOT performance measures. These performance measures are documented in *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries* (referred to as *IHOT 1995* in this report).

The purpose of the performance measures is to implement new basinwide policies that provide regional guidelines for operating anadromous hatcheries in the Columbia Basin.

The audit focuses on performance measures for IHOT policies that cover (1) hatchery performance standards, (2) fish health, (3) ecological interaction, and (4) genetics. These performance measures are intended to guide hatchery operations once production is established. For that reason, the hatchery operations audit included broodstock collection, spawning, incubation of eggs, fish rearing and feeding, fish release, equipment maintenance and operations, and personnel training. Production priorities are beyond the scope of this audit.

Based on *IHOT 1995*, a detailed 109-page audit form was developed. The audit form divided the performance measures into six major sections along major program and technical criteria areas. Two additional sections (sections 1 and 8) include general information and expenditure information needed for this Hatchery Evaluation Report and blank forms for additional comments. The following is the basic structure of the IHOT audit form:

- Section 1 Performance Measures for General Information and Expenditure
Information (PMs General 1-2)
- Section 2 Performance Measures for Program Objectives (PMs 1-4)

Integrated Hatchery Operations Team (IHOT) 1995. *Policies and Procedures for Columbia Basin Anadromous Salmonid Hatcheries*, Bonneville Power Administration, Portland, Oregon.

Section 3	Performance Measures for Facility Requirements (PMs 5-15)
Section 4	Performance Measures for Hatchery Practices (PMs 16-25)
Section 5	Performance Measures for Fish Health Policy (PMs 26-34)
Section 6	Performance Measures for Ecological Interactions (PMs 35-38)
Section 7	Performance Measures for Genetics Policy (PMs 39-43)
Section 8	Blank Forms for Additional Comments

Several performance measures are repeated in various sections of the audit form. These performance measures overlap in *IHOT 1995* and were retained to allow individuals interested in specific portions of the audit (such as Genetics or Fish Health) to determine the compliance status of all performance measures for a given topic in one location. A repeated performance measure is indicated by shaded text.

The Hatchery Audit Process

The hatchery audit will be conducted over a 2-year period that concludes in 1997. At each hatchery, a five-step process was used to complete the overall hatchery audit. This process consisted of research and onsite visits. The site visit at the Wallowa Hatchery was conducted on September 9, 1996.

The following is the five-step audit process:

1. Information was obtained from headquarters.
2. The hatchery manager was asked to fill out and return the **Audit Form**.
3. A 1-2 day site audit visit was conducted at each hatchery. During that visit an audit team inspected facilities, reviewed hatchery records, discussed audit form responses, and developed remedial action plans when appropriate.

4. During the site visit, the compliance status of each performance measure was discussed with the hatchery manager and IHOT representative. A portion of the Hatchery Evaluation Report was sent to the hatchery manager following the audit visit as a **Compliance Report**. That Compliance Report is Table 2 of this report.
5. This information was used to prepare a draft **Hatchery Evaluation Report**. This draft report was submitted to the operating agencies for review of the information used to determine compliance. Based on review and comments, a final Hatchery Evaluation Report was developed. The final report documents the compliance of a particular hatchery with the IHOT performance measures and presents cost estimates to correct any deficiencies.

Compliance Status of Wallowa Hatchery - Summer Steelhead (Imnaha Stock)

The following table includes information on life-stages that are held on this facility for some portion of their rearing cycle (Table 1). For multi-facility programs, summary cost and contribution data is presented at the facility where rearing occurs. For the compliance status relating to performance measures that do not occur at this hatchery, please refer to the Hatchery Evaluation Reports for the hatcheries and stocks listed in Table 1. A check mark (✓) indicates that the specific life stage is held at this facility.

This section documents the compliance status of the Wallowa Hatchery - Summer Steelhead (Imnaha Stock) program. Each performance measure is presented in a table taken from the audit form (Table 2). The compliance status is identified by the following categories:

- **N/A** (not applicable)
- **Yes** (in compliance)
- **?** (unknown; generally due to unavailability of information to determine compliance)
- **No** (not in compliance).

Remedial actions are suggested for performance measures not in compliance. These remedial actions are grouped into categories and listed in Section 4 of this report, where the cost of the required remedial actions is also presented.

Table 1 Summary Program Information for Wallowa Hatchery - Summer Steelhead (Imnaha Stock)

Component	Location of Adult Holding, Spawning, Incubation, and Rearing					
	Wallowa Hatchery	Little Sheep Creek Facility	Irrigon Hatchery			
Adult Collection		4				
Adult Holding		4				
Spawning		4				
Fertilization		4				
Incubation	4					
green-to-eyed	4					
eyed-to-hatch			4			
Rearing			4			
fry			4			
fingerlings			4			
smolts		4	4			
Acclimation/release		4				

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#1	Are the hatchery programs outlined in a subbasin management plan?		4			Columbia Basin System Planning Production Plan and LSRCP Annual Operation Plan	
#2	Is the hatchery operating under a current hatchery operational plan? Is it understood by staff? Is it being followed?		4 4 4			IHOT Operations Plan and LSRCP Annual Operation Plan	
#3	Is a hatchery monitoring and evaluation plan in place? Do you have a written monitoring and evaluation plan?		4 4			LSRCP Annual Operation Plan	
#4a	Adult contribution to fisheries, spawning grounds, and hatchery	4				Contribution data reported at Irrigon Hatchery	
#4b	Adult pre-spawning survival as compared with established goal		4			In compliance 3 out of last 3 years	
#4c	Egg-take as compared with established hatchery goal				4	In compliance 1 out of last 3 years	Improve adult return

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#4d	Green-egg to eyed-egg survival as compared with established goal		4			In compliance 3 out of last 3 years; No goal listed in IHOT Operation Plan	Develop green-egg to eyed-egg goal for IHOT Operations Plan
#4e	Eyed-egg to fry survival as compared with established goal	4				Eyed eggs transferred to Irrigon Hatchery	
#4f	Fry to smolt survival as compared with established goal	4				Fish reared at Irrigon Hatchery	
#4g	Production as compared with established goal		4			In compliance 3 out of last 3 years	
#4h	Percent survival (smolt to adult) as compared with established goal				4	In compliance 2 out of last 5 years	Improve adult return
#4i	Number of eggs, fry, fingerlings, smolts, and/or adults to meet basinwide needs	4					

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#5a	Temperature						
	Does your water temperature meet the criteria for spawning?				4	Review of records/Discussion. Range a few degrees too high.	Does not appear to be a problem
	Does your water temperature meet the criteria for incubation?				4	Review of records/Discussion. Spring OK, well 1°F too high.	Does not appear to be a problem
	Does your water temperature meet the criteria for rearing?				4	Review of records/Discussion. Can be a little too warm or cold.	Does not appear to be a problem
#5b	Dissolved gases						
	Is the oxygen level near saturation?			4		No data provided to team	Measure and record DO
	Is the dissolved nitrogen level less than saturation?			4		No data provided to team	Obtain satumeter; measure and record TGP

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#5c	Chemistry			4		No data provided to team	Run analysis for chemistry parameters
	Ammonia (un-ionized)			4		No data provided to team	
	Carbon Dioxide			4		No data provided to team	
	Chlorine			4		No data provided to team	
	pH			4		No data provided to team	
	Copper			4		No data provided to team	
	Hydrogen Sulfide			4		No data provided to team	
	Iron			4		No data provided to team	
	Zinc			4		No data provided to team	
				4			
#5d	Turbidity						
	Does your turbidity meet the criteria?			4		No data provided to team	Run analysis for turbidity
#5e	Alkalinity and hardness						
	Does your alkalinity and hardness meet the criteria?			4		No data provided to team	Run analysis for alkalinity and hardness
#5f	Nitrite						
	Does your nitrite meet the criteria?			4		No data provided to team	Run analysis for nitrite

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#5g	Contaminants			4		No data provided to team	Run analysis for contaminants
	Aldrin			4		No data provided to team	
	Endrin			4		No data provided to team	
	Dieldrin			4		No data provided to team	
	Heptachlor			4		No data provided to team	
	Chlordane			4		No data provided to team	
	Methoxychlor			4		No data provided to team	
	Lindane			4		No data provided to team	
	Malathion			4		No data provided to team	
	Guthion			4			

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#5h	Pathogens What portions of the hatchery have disease-free water? Adult holding Incubation (wells) Incubation (upper spring) Early rearing Rearing Others (acclimation)		4		4	Discussion Discussion Need to cover if used for incubation Discussion Discussion Discussion <u>General Comment:</u> Problems with Spring Creek water supply in some years. May be a constraint to meeting production in future years.	Does not appear to be a problem Does not appear to be a problem

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#6	Alarm Systems						
	Do the following areas have alarms?						
	Intake		4			Inspection of facilities/ Discussion	
	Large rearing ponds and adult holding ponds		4			Inspection of facilities/ Discussion	
	Raceway headboxes and rearing ponds	4				Inspection of facilities/ Discussion	
	Incubation facilities		4			Inspection of facilities/ Discussion	
	Quarantine areas and facilities	4				Inspection of facilities/ Discussion	
	Water treatment systems	4				Inspection of facilities/ Discussion	
	Security		4				
	Are there outside systems and buzzers in on-site residences?					Discussion	
	Are water flow alarms checked daily?		4	4		Review of records /Discussion	Begin routine testing of alarms
	Are all other alarms checked weekly?			4		Review of records /Discussion	Begin routine testing of alarms
	Is there a log of alarms for emergencies, tests, and maintenance requirements?			4		Review of records/Discussion	Current annunciator panel is not working and needs to be replaced
	Are telephone pagers used?					Discussion; at hatchery but not at the satellites	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#7	Adult collection and holding facilities Do you meet the adult holding criteria?		4			Review of records/Discussion	
#8	Incubation facilities Type 1: Vertical Tray Do you have an adequate number of units for the overall program?		4			Inspection of facilities/Discussion	
#9	Rearing facilities Type 1: Concrete acclimation ponds (acclimation Little Sheep Creek Facility) Do you have an adequate number of units for the overall program?		4			Inspection of facilities/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#10	Screening facilities						
	Do you meet the approach velocity criteria?		4			Inspection of facilities/Discussion	
	Are the fish screens regularly cleaned?		4			Inspection of facilities/Discussion	
	Does the screen mesh meet screen opening criteria?		4			Inspection of facilities/Discussion	
	Are rearing containers double screened for fish that should not be released to adjacent water?		4			Inspection of facilities/Discussion	
#11	Predator control facilities						
	Are your predation control facilities effective?		4			Inspection of facilities/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No	
#12	Food storage facilities and quality control					
	Does the storage of dry/semi-moist/moist foods (dry<12%; semi-moist 12-20%; moist >20% moisture) follow food manufacturer's recommendations?					
	Does a regional quality control officer oversee production procedures and monitor:					
	Verification by feed manufacturer that ingredients meet specifications?					
	Ensure feed does not contain unwanted drugs or other additives?					
	Analyze ingredients contained in the final food product to ensure that feed specifications have been met?					
	Are the foods stored and handled according to the following criteria?					
	Moist pellets should not exceed 10 °F at point of					

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
		4				Discussion; dry feed only	
						Jean Paul Lagesse at Clackamas Hatchery monitors feed quality using feeding trials only	Conduct IHOT feed QA/QC
					4	Discussion	
					4	Discussion	
					4	Discussion	
						Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#13	Release facilities Do the release facilities ensure that fish are not subjected to adverse conditions?		4			Inspection of facilities/Discussion	
#14	Pollution abatement facilities Do the pollution abatement facilities meet all federal and state regulations (or good engineering practice)? Are pollution abatement facilities operated correctly?		4 4			Inspection of facilities/Discussion; Discussion	
#15	Transportation facilities Are the transport systems adequate to meet IHOT performance measures for transportation practices?		4			Inspection of facilities/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#16	Broodstock selection practices						
	Is the donor selection process document attached?	4				Existing program; does not apply	
	Was the donor selection outline followed in selecting the hatchery broodstock?	4				Existing program; does not apply	
	Go to PM #40 in Genetics						
#17	Spawning practices						
	Were the appropriate number of spawners, male/female ratios, and fertilization protocols used?				4	Review of records/Discussion; use a pooled 3x3 matrix rather than true 3x3 matrix. Not in compliance with IHOT or LSRCP Annual Operation Plan	Follow IHOT and LSRCP protocols for fertilization
	Go to PM #42 in Genetics Section						

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#18	Incubation practices						
	Are specific incubation standards listed in the hatchery operations plan?				4	Not in IHOT Operations Plan or LSRCP Annual Operation Plan	Develop incubation standards for IHOT
	Are incubation practices written?				4	None supplied	See above
	Incubation Type 1: 4-stack vertical stack (see PM #8)					Review of records/Discussion	Develop incubation standards for IHOT
	Do you meet the loading and flow criteria?				4	Review of records/Discussion	No criteria listed for 4-stack vertical incubators; develop criteria

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#19	Rearing practices (Acclimation only) Are specific rearing standards listed in the hatchery operations plan? Are rearing practices written? Rearing Unit Type 1: Concrete ponds (see PM #9) Do you meet the density and DI criteria? Do you meet the Loading and FI criteria?				4 4 4 4	None listed in IHOT Operations Plan or LSRCF Annual Operation Plan Review IHOT Operation Plan Review of records/Discussion Review of records/Discussion	Develop acclimation standards for IHOT Develop acclimation standards for IHOT Review criteria and hatchery operations
#20	Smolt quality Do you produce a high quality smolt?		4			Discussion; very good due to use of volitional release	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No	
#21	Fish health management practices Are the monthly hatchery monitoring visits being conducted? (PM #26) Are the annual broodstock inspections being conducted? (PM #27) Is there pathogen-free water and are the sanitation procedures being followed? (PM #28) Are the following water quality parameters within criteria? (PM #5a-5h) Water temperature Dissolved gases Chemistry Turbidity Alkalinity and hardness Nitrite Contaminants Are rearing standards being followed? (PM #19) Are egg and fish transfer/release requirements met?					

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
			4			Review of records/Discussion	
			4			Review of records/Discussion	
					4	Some of the incubation water may not be pathogen-free; footbaths not used in incubation	Cover upper spring or pump lower spring; install footbaths in incubation areas
					4	Review of records/Discussion	Does not appear to be a problem
				4		No data supplied to team	Run analysis
				4		No data supplied to team	Run analysis
				4		No data supplied to team	Run analysis
				4		No data supplied to team	Run analysis
				4		No data supplied to team	Run analysis
				4		No data supplied to team	Run analysis
			4			Review of records/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#22a	Does hatchery performance meet requirements outlined in the regional hatchery policies and in subbasin and hatchery plans for the following areas?						
#22a1	Percent smoltification Do you measure percent smoltification? Did you meet the smoltification criteria?			4	4	Research collects this information; no information provided to team Goal 100%	Measure smoltification Review goal and monitoring protocols
#22a2	Rearing density (prior to release) Did you meet the rearing density criteria just prior to release?				4	Review of records/Discussion Out of compliance 2 out last 2 years at Little Sheep Creek facility	Change hatchery operations or review loading and density criteria
#22a3	Disease condition (at release) Did you meet all disease regulations just prior to release?		4			Review of records/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#22a4	Number (at release) Did you meet the release number goal?		4			Review of records/Discussion	
#22a5	Size at release Did you meet the size goal?		4			Review of records/Discussion	
#22a6	Dates of release Did you meet the release date goal?		4			Review of records/Discussion	
#22a7	Location of release Did you release the fish at the specified location?		4			Review of records/Discussion	
#22b	Are fish reared in the subbasin or acclimated in the subbasin? Are the fish reared in the subbasin? Are the fish acclimated in the subbasin?		4		4	Discussion Discussion	Reared at Irrigon Hatchery because of the lack of water in Imnaha basin

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#22c	Is the release strategy appropriate for the program?		4			Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No	
#23	<p>Transportation facilities</p> <p>Do transportation equipment and personnel receive disinfection before and after use?</p> <p>Is the fish tank interior disinfected using a solution of 200 ppm active chlorine for 30 minutes minimum or formaldehyde gas generation method (relative humidity of 60% for 2 hrs)?</p> <p>Is the exterior of the fish transport vehicle disinfected using high pressure steam (115-130°C), high temperature acid, or with 200 ppm chlorine for 30 minutes?</p> <p>Is the fish transport vehicle (cab) disinfected using 600 ppm quaternary ammonia compounds (1.5 ml of 50% stock solution/liter water)?</p> <p>Is other equipment disinfected including fish pumps, nets, egg sorters, waders, boots, rain gear, hoses and other equipment using one of the following solutions?</p> <p>200 ppm chlorine for 30 minutes</p> <p>600 ppm quaternary ammonia compound for 30</p>					

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
					4	Discussion; do not disinfect when hauling adults	Follow IHOT disinfection policy
					4	Discussion; do not disinfect when hauling adults	Follow IHOT disinfection policy
					4	Discussion	Follow IHOT disinfection policy
					4	Discussion	Follow IHOT disinfection policy
			4			Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No	
#23 (cont)	<p>Transportation facilities</p> <p>Does a pre-loading inspection covering: tank water level, pumps or aerators, oxygen injection system settings, displacement gauge, and truck loading/hauling density tables checked and reviewed occur prior to loading fish in the transport unit?</p> <p>Do hauling criteria include checking the fish 45 minutes to 1 hour after loading?</p> <p>When fish are active and systems are functioning properly, is the oxygen concentration reduced and maintained at approximately 8 ppm?</p> <p>Is water temperature in the transportation unit maintained within the 42-48 °F range?</p> <p>Do fish releasing procedures include the following criteria?</p> <p>Releasing the fish at the correct release site or into the correct water body.</p> <p>Tempering or the difference between the liberation</p>					

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
			4			Discussion	
			4			Discussion	
			4			Discussion	
			4			Discussion	
						Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#24	<p>Evaluation practices</p> <p>Has the hatchery conducted fishery contribution studies to:</p> <p>Determine the requirements for evaluating and improving management programs?</p> <p>Develop guidelines that define the geographical area and identify component stocks (hatchery and/or wild) that comprise the management unit?</p> <p>Develop guidelines that define if the proper stocks of fish are currently being used?</p> <p>Determine which management units contribute to a specific fishery and the time periods of those contributions?</p> <p>Determine the relative contributions of the various management units to a specific fishery over the different time periods?</p>	<p>4</p> <p>4</p> <p>4</p> <p>4</p> <p>4</p>				<p>Discussion; information provided at Irrigon</p>	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#25	Training practices						
	Does the hatchery have a training schedule for its staff?		4			Review of records/Discussion	
	Does each staff member have a personal training plan approved by a supervisor and reviewed annually?		4			Review of records/Discussion	
	Does the hatchery routinely exchange training details between other hatcheries and agencies?		4			Review of records/Discussion	
	Does the hatchery encourage and reward off-duty training of staff?		4			Review of records/Discussion	
	Does the hatchery conduct monthly staff meetings?		4			Review of records/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status	Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
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Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#26	Are monthly hatchery monitoring visits being conducted by a qualified fish health specialist as described below?						
	Conduct visit at least monthly		4			Review of records/Discussion	
	Monitoring conducted by qualified fish health specialist		4			Review of records/Discussion	
	Examine a representative sample of healthy and moribund fish from each lot.		4			Review of records/Discussion	
	Review fish culture practices with hatchery manager.		4			Review of records/Discussion	
	Report finding and results of necropsies on standard form.		4			Review of records/Discussion	
	Recommend appropriate drug or chemical treatment.					Review of records/Discussion	
	Summarize fish health status or stock prior to release or transfer to another facility.		4			Review of records/Discussion	
			4				

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#27	<p>Are all of the functions of the hatchery yearly monitoring visits being completed as described below?</p> <p>Annually examine each broodstock for the presence of reportable viral pathogens.</p> <p>Annually screen each salmon broodstock for the presence of <i>Renibacterium salmoninarum</i>.</p> <p>Conduct inspection by or under the supervision of qualified fish health specialist.</p>		<p>4</p> <p>4</p> <p>4</p>			<p>Review of records/Discussion</p> <p>Review of records/Discussion</p> <p>Review of records/Discussion</p>	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No	
#28	<p>Is the hatchery following accepted sanitation procedures?</p> <p>Are there any sources of pathogen-free water, especially for incubation and early rearing?</p> <p>Are the hatchery sanitation procedures understood and being followed as describe below?</p> <p>Disinfect/water harden eggs in iodophor?</p> <p>Are foot baths containing disinfectant placed at the incubation facility's entrance and exit?</p> <p>Is equipment and rain gear utilized in broodstock handling or spawning sanitized prior to its use elsewhere in the hatchery?</p> <p>Is equipment used to collect dead fish sanitized prior its use in another pond and/or lot of fish?</p> <p>Is equipment, including vehicles used to transfer fish between facilities, disinfected prior to use with any other fish lots or at any other location?</p>					

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
			4			Well is disease free;	
			4			Inspection of facilities/Discussion.	
					4	Inspection of facilities/Discussion	Install footbaths
			4			Inspection of facilities/Discussion	
			4			Inspection of facilities/Discussion	
			4			Inspection of facilities/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#29	<p>Are water quality parameters being followed?</p> <p>Are the following water quality parameters within criteria? (PM #5a-5h)</p> <p>Water temperature</p> <p>Dissolved gases</p> <p>Chemistry</p> <p>Turbidity</p> <p>Alkalinity and hardness</p> <p>Nitrite</p> <p>Contaminants</p> <p>Go to PM #21</p>						
					4	See PM #5a	
				4		No data supplied to team	Run analysis for water quality parameters
				4		No data supplied to team	
				4		No data supplied to team	
				4		No data supplied to team	
				4		No data supplied to team	
				4		No data supplied to team	
				4		No data supplied to team	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#30	<p>Are incubation and rearing standards being followed?</p> <p>Are the incubation practices following the IHOT incubation criteria? (PM #18)</p> <p>Are the rearing practices following the IHOT criteria? (PM #19)</p> <p>Go to rearing practices PM #18-PM #19</p>				<p>4</p> <p>4</p>	<p>Review of records/Discussion</p> <p>Review of records/Discussion</p>	<p>No criteria listed in IHOT for 4-stack vertical tray incubators; develop criteria</p>
#31	<p>Are egg and fish transfer/release requirements met?</p>		4			<p>Discussion</p>	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status				Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
		N/A	Yes	?	No		
#32	Is the hatchery's program outlined in a subbasin management plan? Go to subbasin plan PM #1		4			Columbia Basin System Planning Production Plan and LSRCP Annual Operation Plan	
#33	Is the hatchery operating under a current hatchery operational plan? Go to operational plan PM #2		4			IHOT Operations Plan and LSRCP Annual Operation Plan	
#34	Is a hatchery monitoring and evaluation plan in place? Go to hatchery monitoring and evaluation plan PM #3		4			LSRCP Annual Operation Plan	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status	Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
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Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#35	<p>Does the hatchery program meet requirements established in the regional hatchery policies and subbasin planning documents in the following areas: species, stock, broodstock collection location, broodstock numbers, broodstock collection strategy, and spawning and egg-take protocols?</p> <p>Does the hatchery program meet the requirements for the following?</p> <p>Species protocols (PM #4a)</p> <p>Stock protocols (PM #4a)</p> <p>Broodstock collection location protocols (PM #41)</p> <p>Broodstock numbers protocols (PM #42)</p> <p>Broodstock collection strategy protocols (PM #41)</p> <p>Spawning protocols (PM #42)</p> <p>Egg-take protocols (PM #42)</p>						
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status	Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
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Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#36	<p>Does the hatchery's performance meet requirements outlined in the regional hatchery policies and in subbasin and hatchery plans for the following areas: percent smoltification, rearing density, disease condition, and the number, size date(s), and location of release?</p> <p>Percent smoltification (PM #22a1)</p> <p>Rearing density (PM #22a2)</p> <p>Disease condition (PM #22a3)</p> <p>Number at release (PM #22a4)</p> <p>Size at release (PM #22a5)</p> <p>Date of release (PM #22a6)</p> <p>Location of release (PM #22a7)</p>						
					4	Goal 100%	Review goal
					4	Review of records/Discussion	See PM #22a2
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	
			4			Review of records/Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#37	Are fish reared in the subbasin or acclimated in the subbasin? See PM #22b				4	Discussion. Fish reared at Irrigon due to lack of water in Imnaha basin. All acclimated.	None
#38	Is the release strategy appropriate for the program? See PM #22c		4			Discussion	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

PM #	Description of Performance Measure	Compliance Status	Basis for Compliance or Non-Compliance	Remedial Action Needed for Compliance
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Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#39	For new programs, has a broodstock collection plan been developed?						
	Is the broodstock collection plan written?	4				Existing Program; does not apply	
	For a non-captive broodstock program:						
	Was an unbiased, representative sample collected?	4				Existing Program; does not apply	
	Was the recommended number of broodstock collected?	4				Existing Program; does not apply	
	For a captive broodstock program:						
	Were captive brood progeny excluded as donors for propagating the next generation of the captive broodstock program?	4				Existing Program; does not apply	
	Were full-sib crosses avoided?	4				Existing Program; does not apply	
	Is the broodstock collection plan understood and being followed by staff?	4				Existing Program; does not apply	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#40	<p>For a new program, was the donor selection outline followed in selecting the hatchery broodstock?</p> <p>Is a donor selection plan written?</p> <p>Was the donor selection outline followed in the selecting the broodstock?</p> <p>Was the target stock recommended in the donor selection process actually used?</p>	<p>4</p> <p>4</p> <p>4</p>				<p>Existing Program; does not apply</p> <p>Existing Program; does not apply</p> <p>Existing Program; does not apply</p>	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#41	<p>For existing programs, were the broodstock collection procedures followed?</p> <p>Is the broodstock collection plan written?</p> <p>Does the broodstock collection plan follow the guideline:</p> <p>Was an unbiased, representative sample collected?</p> <p>Was the recommended number of broodstock collected?</p> <p>Were the broodstock collection procedures in hatchery operation plan understood and followed?</p> <p>Were the broodstock collection procedures in hatchery operation plan understood and followed?</p>		<p>4</p> <p>4</p> <p>4</p> <p>4</p> <p>4</p> <p>4</p>			<p>Review broodstock collection plan in LSRCP Annual Operation Plan</p> <p>Discussion</p> <p>Discussion</p> <p>Discussion</p> <p>Discussion</p>	

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No	
#42	Was the appropriate number of spawners, male/female ratios, and fertilization protocols used?					
	Are the spawning protocols written?					
	Are daily or weekly spawning logs available?					
	Was the appropriate number of spawners used?					
	Did you attempt to spawn all collected broodstock and randomize mating with respect to age class, and other traits?					
	Was the sex-ratio within the limits given in the performance standards?					
	Were the fertilization protocols followed?					
	If the hatchery needed to reduce the number of eggs					

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
			4			Review spawning protocols in LSRCP Annual Operation Plan	
			4			Review of records	
			4			Review of records	
			4			Discussion	
			4			Discussion	
					4	Not in compliance with IHOT or with LSRCP Annual Operation Plan; using a pooled 3 X 3 pooled fertilization matrix rather than a true 3x3 matrix	Follow IHOT and LSRCP protocols for fertilization

Table 2 Wallowa Hatchery - Summer Steelhead (Imnaha Stock) Compliance With Performance Measures

		N/A	Yes	?	No		
#43	<p>Is there a genetics monitoring and evaluation program in place?</p> <p>Is a genetics monitoring and evaluation program available?</p> <p>Does the plan address the following elements listed in IHOT:</p> <p>Does the program have elements needed to meet evaluation goals 1-4?</p> <p>Has a qualified geneticist reviewed and endorsed the program (goal 5)?</p> <p>Will the program collect the data and maintain the records needed to evaluate compliance on an ongoing basis (goal 5)?</p> <p>Is the program understood and followed by staff?</p>				<p>4</p> <p>4</p> <p>4</p> <p>4</p> <p>4</p> <p>4</p>	<p>Discussion</p> <p>Discussion</p> <p>Discussion</p> <p>Discussion</p> <p>Discussion</p>	Develop genetics M&E plan for IHOT.

Remedial Actions

Based on the compliance status for each performance measure, remedial actions were developed. The required remedial actions are organized into five categories. The types of categories range across a spectrum from those actions that are beyond human control, to those that require a change in agency policy or procedures, to those that involve a significant capital cost to put in place. The following are the five types of remedial actions identified under phase 1 of the audit:

The Five Types of Remedial Actions

Type	Description
1	Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery
2	Remedial actions requiring changes in agency policies or procedures
3	Remedial actions requiring changes in monitoring coverage or interval
4	Remedial actions requiring significant capital expenditures
5	Remedial actions that may require significant capital expenditures but are not clearly definable at this time

Remedial Actions at Wallowa Hatchery - Summer Steelhead (Imnaha Stock)

This section presents the corrective actions required to bring the Wallowa Hatchery - Summer Steelhead (Imnaha Stock) program into compliance with IHOT performance measures. The remedial actions suggested here are just that, suggestions developed by the Montgomery Watson Audit Team. For some non-compliance areas, other remedial actions could be proposed. The required remedial actions are cross-referenced to each IHOT performance measure that was not in compliance. Where appropriate, the costs associated with the remedial actions are also presented (Table 3).

The cost estimates presented in this section are based on professional experience from similar projects. In most cases, only a lump-sum figure is presented, and detailed take-off lists have not been prepared. The cost estimates are essentially order of magnitude estimates ($\pm 40\%$).

More importantly, the suggested remedial activities may also present several levels of action. Optional actions have been listed for several problems. These optional actions are desirable for either operational or safety considerations.

**Table 3. Remedial Actions Required at Wallowa Hatchery - Summer Steelhead
(Imnaha Stock)**

Remedial Action Required	Cost	PMS ¹
Type 1 - Non-compliance issues resulting from items beyond human control or Performance Measures not relevant for this hatchery		
Improve adult return	---	4c,4h
Modify temperature of hatchery water supply	---	5a

Remedial Action Required	Cost	PMS ¹
Type 2 - Remedial actions requiring changes in agency policies or procedures		
Develop green-egg to eyed survival goal	---	4d
Begin routine testing of alarms using IHOT recommendations	---	6
Follow IHOT and LSRCP protocols for fertilization	---	17,42
Develop specific incubation standards for the Operation Plan	---	18
Develop specific acclimation standards for the Operation Plan	---	19
Develop smoltification goal and monitoring plan	---	22a1
Review density criteria for acclimation	---	22a2
Follow IHOT disinfection policies for transportation	---	23
Improve communication between evaluation biologists and hatchery manager	---	24
Install footbaths in incubation areas	---	28
Develop genetics M&E plan for IHOT	---	43

Remedial Action Required	Cost	PMS ¹
Type 3 - Remedial actions requiring changes in monitoring coverage or interval		
Monitor DO and TGP	---	5b
Run analysis for chemistry parameters	---	5c
Run analysis for turbidity	---	5d
Run analysis for alkalinity and hardness	---	5e
Run analysis for nitrite	---	5f
Run analysis for contaminants	---	5g
Conduct IHOT feed QA/QC testing	---	12
Type 4 - Remedial actions requiring significant capital expenditures		
Replace annunciator panel for hatchery alarms	\$45,000	6
Type 5 - Remedial actions that may require significant capital expenditures but are not clearly definable at this time		
None		

Hatchery Contribution to Fisheries, Spawning Grounds, and Hatcheries

This section presents the audit findings for the Wallowa Hatchery - Summer Steelhead (Imnaha Stock) program contribution of adult fish to fisheries, local fisheries, spawning grounds, and hatcheries. Data is reported by broodyear. A broodyear refers to the adult contribution from the eggs produced from a single group of spawning adults. For some species, this may include fish caught as 2-, 3-, 4-, 5-, and 6-year old fish. Because of the return distribution and data processing delays, the complete adult contribution for a given broodyear may not be available until 4 to 5 years after the fish have been released from the hatchery.

**Table 4. Adult Contribution to Fisheries, Spawning Grounds, and Hatcheries:
Wallowa Hatchery - Summer Steelhead (Imnaha Stock)**

Year	Fisheries (Broodyear)	Spawning Grounds¹ (Broodyear)	Hatchery¹ (Broodyear)	Total Combined Contribution (Broodyear)	Smolt to Adult Survival (percent)
1981	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery

¹¹ Data obtained from Missing Production Groups Annual Report or from the Regional Mark Information System database.

¹¹ Total combined adult contribution; presented when it is not possible to subdivide the contribution into fisheries, spawning grounds, and hatchery contributions.

1982	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1983	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1984	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1985	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1986	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1987	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1988	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1989	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1990	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1991	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery
1992	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery	see Irrigon Hatchery

Annual Operating Expenditures

The level and detail of annual operating expenditures varies widely depending on hatchery, operating agency, and funding source. When provided, expenditures were presented in terms of personnel costs, operating costs (power, feed, supplies), capital costs, indirect costs charged to the Federal government, third-party costs, and other costs. These cost components were summed to determine a total hatchery annual cost. Based on discussion with the hatchery manager, the percent of total hatchery costs allocated to a given program was estimated. The total hatchery costs and the percent of hatchery costs allocated to a given program were used to compute the cost of a given program. Table 5 shows the annual operating expenses for the overall Wallowa Hatchery Summer Steelhead, Imnaha Stock program. For programs that occur at more than one facility (as shown on Table 1 in Section 3 of this report), the cost breakdown for the component(s) at each hatchery is presented in a separate table (Table 5a).

**Table 5. Annual Operating Expenses: Wallowa Hatchery - Summer Steelhead
(Imnaha Stock)**

Hatchery	1994	1995	1996
1. Wallowa Hatchery	\$53,496	\$38,679	\$49,880
2.			
3.			
4.			
5.			
Total Program Costs	See Irrigon Hatchery	See Irrigon Hatchery	See Irrigon Hatchery

The total expenditures for the Wallowa Hatchery are presented in Table 6 by program. The detailed breakdown of program expenditures at this hatchery is presented in separate tables (Tables 6a, 6b, and 6c).

Table 6. Annual Operating Expenses - Wallowa Hatchery

Program	1994	1995	1996
1. Summer Steelhead, Imnaha Stock	\$53,496	\$38,679	\$49,880
2. Summer Steelhead, Grande Ronde Stock	\$169,000	\$176,206	\$187,643
3. Rainbow Trout (State Funds)	\$111,108	\$111,108	\$97,125
4.			
5.			
Total Hatchery Costs	\$333,604	\$325,993	\$334,648

**Table 5a. Annual Operating Expenses: Wallowa Hatchery - Summer Steelhead
(Imnaha Stock)**

Expenditure Occurring at Wallowa Hatchery

Component	1994	1995	1996
Personnel Costs	\$103,082	\$107,313	\$121,879
Operational Costs	\$61,469	\$64,275	\$75,634
Capital Costs	\$24,518	\$8,173	0
Indirect Costs	\$33,831	\$35,124	\$40,010
Lumped Hatchery Costs			
Lumped Third-Party Costs	0	0	0
Total Hatchery Costs	\$222,900	\$214,885	\$237,523
Source of Funds			
Program Production (#)	253,000	231,000	269,00
Total Production (#)	1,0650,000	1,268,000	1,298,000
Program as Percent of Total	24%	18%	21%
Program Costs	\$53,496	\$38,679	\$49,880

¹ When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

Table 6a. Detailed Expenditures at Wallowa Hatchery by Program

Summer Steelhead, Imnaha Stock

Component	1994	1995	1996
Personnel Costs	\$103,082	\$107,313	\$121,879
Operational Costs	\$61,469	\$64,275	\$75,634
Capital Costs	\$24,518	\$8,173	0
Indirect Costs	\$33,831	\$35,124	\$40,010
Lumped Hatchery Costs			
Lumped Third-Party Costs	0	0	0
Total Hatchery Costs	\$222,900	\$214,885	\$237,523
Source of Funds			
Program Production (#)	253,000	231,000	269,00
Total Production (#)	1,0650,000	1,268,000	1,298,000
Program as Percent of Total	24%	18%	21%
Program Costs	\$53,496	\$38,679	\$49,880

¹ When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

Table 6b. Detailed Expenditures at Wallowa Hatchery by Program

Summer Steelhead, Grande Ronde Stock

Component	1994	1995	1996
Personnel Costs	\$103,082	\$107,313	\$121,879
Operational Costs	\$61,469	\$64,275	\$75,634
Capital Costs	\$24,518	\$8,173	0
Indirect Costs	\$33,831	\$35,124	\$40,010
Lumped Hatchery Costs			
Lumped Third-Party Costs	0	0	0
Total Hatchery Costs	\$222,900	\$214,885	\$237,523
Source of Funds			
Program Production (#)	812,000	1,037,000	1,029,000
Total Production (#)	1,0650,000	1,268,000	1,298,000
Program as Percent of Total	76%	82%	79%
Program Costs	\$169,000	\$176,206	\$187,643

¹ When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

Table 6c. Detailed Expenditures at Wallowa Hatchery by Program

Rainbow Trout (State Program)

Component	1994	1995	1996
Personnel Costs	\$79,661	\$79,661	\$70,463
Operational Costs	\$31,447	\$31,447	\$26,662
Capital Costs	0	0	0
Indirect Costs	0	0	0
Lumped Hatchery Costs			
Lumped Third-Party Costs	0	0	0
Total Hatchery Costs	\$111,108	\$111,108	\$97,125
Source of Funds			
State of Oregon			
Program Production (#)			
Total Production (#)			
Program as Percent of Total	100%	100%	100%
Program Costs	\$111,108	\$111,108	\$97,125

¹ When it was not possible to obtain a detailed cost breakdown from an agency or third party, the undivided costs were entered here.

¹1 PMs are performance measures that were extracted from the IHOT 1995 report. The IHOT performance measures are listed in Table 2 (Section 3 of this report) in numerical order.